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GB 1351439
GB 1313134
GB 768677
GB 732164
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(54) Wound dressing

(57) A multi-layered dressing including a layer of curative and absorbant material which contacts the wound, an intermediate layer of deodorizing material, and an air and gas permeable outer flexible layer which secures the dressing to the body.

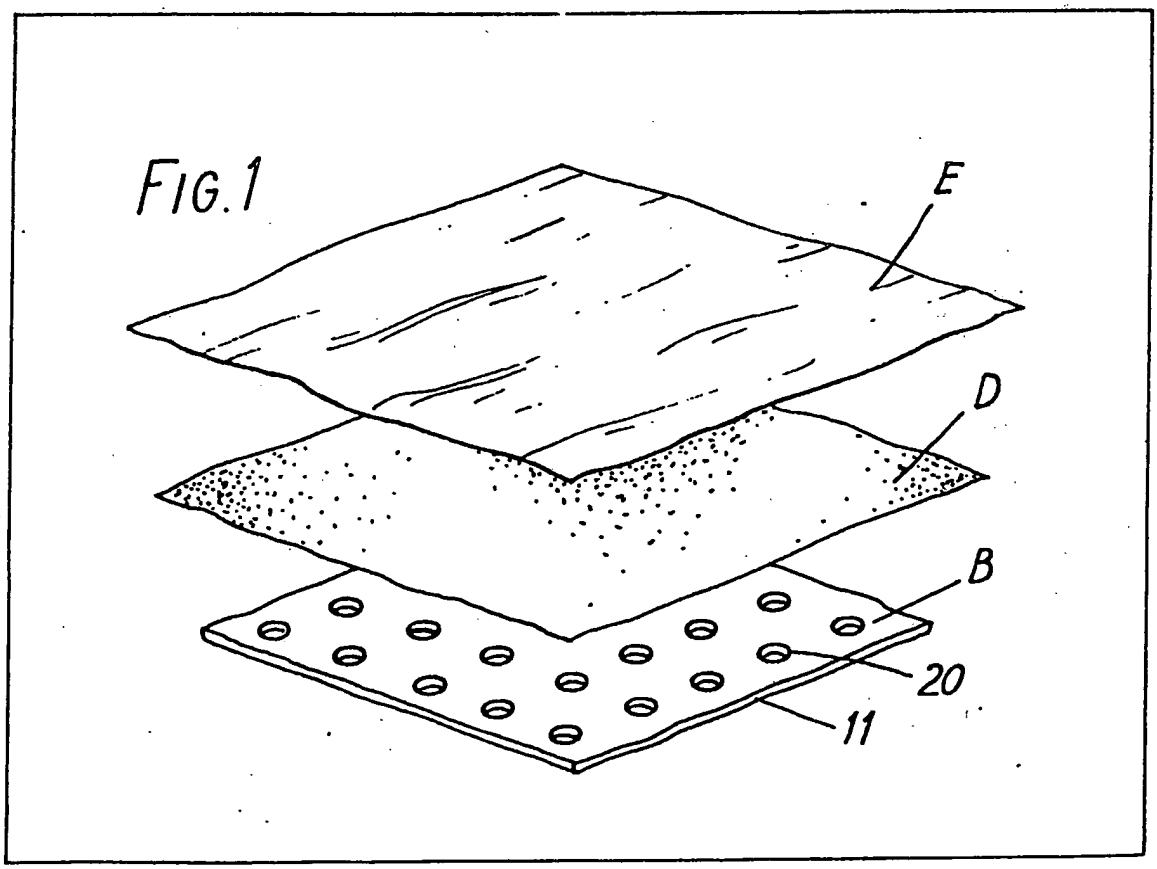

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FIG.1

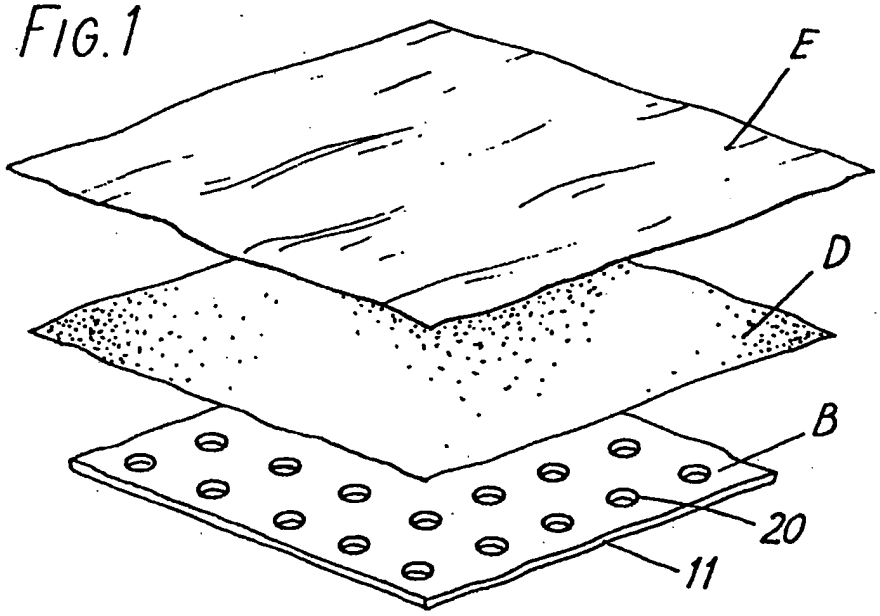

FIG.2

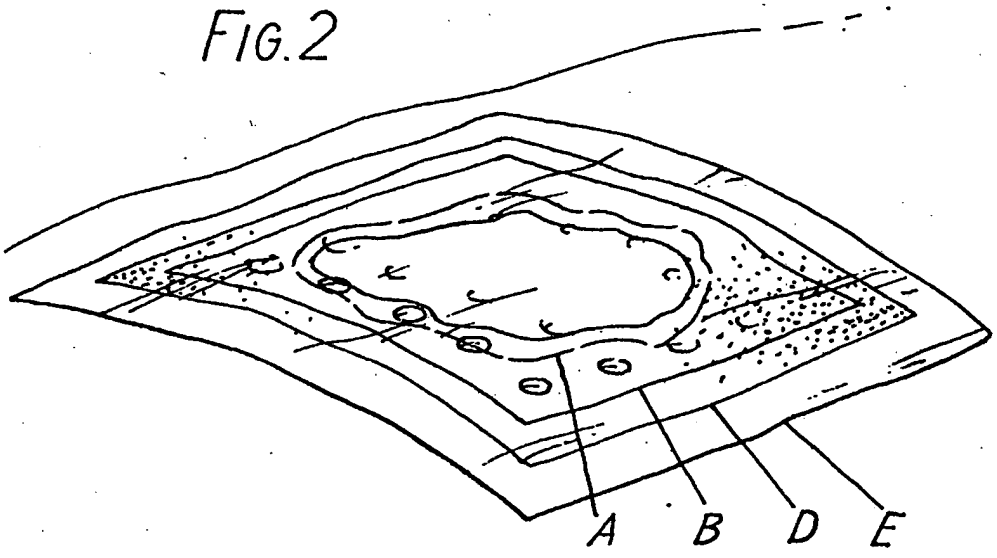

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FIG. 3

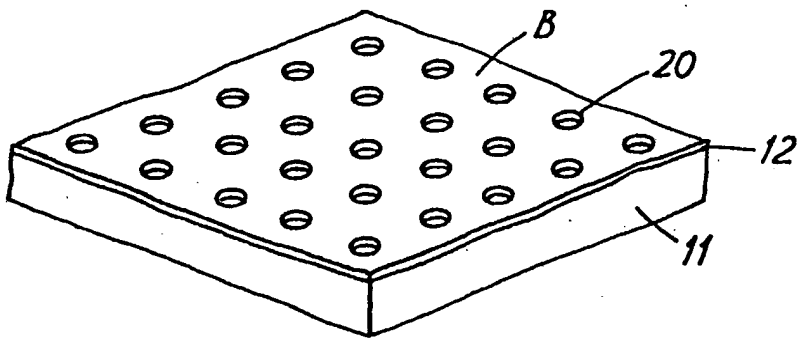

FIG. 4

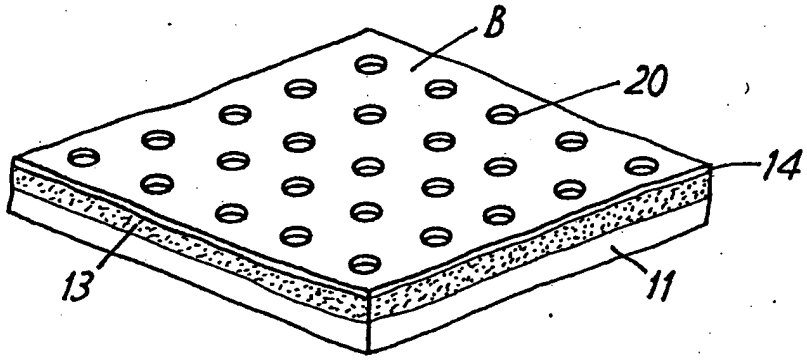

FIG. 5

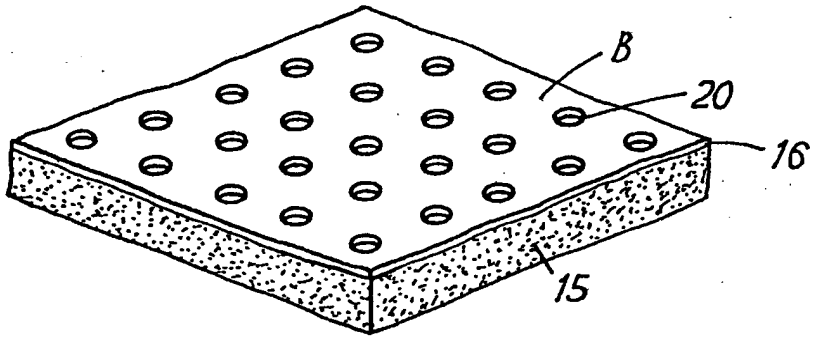

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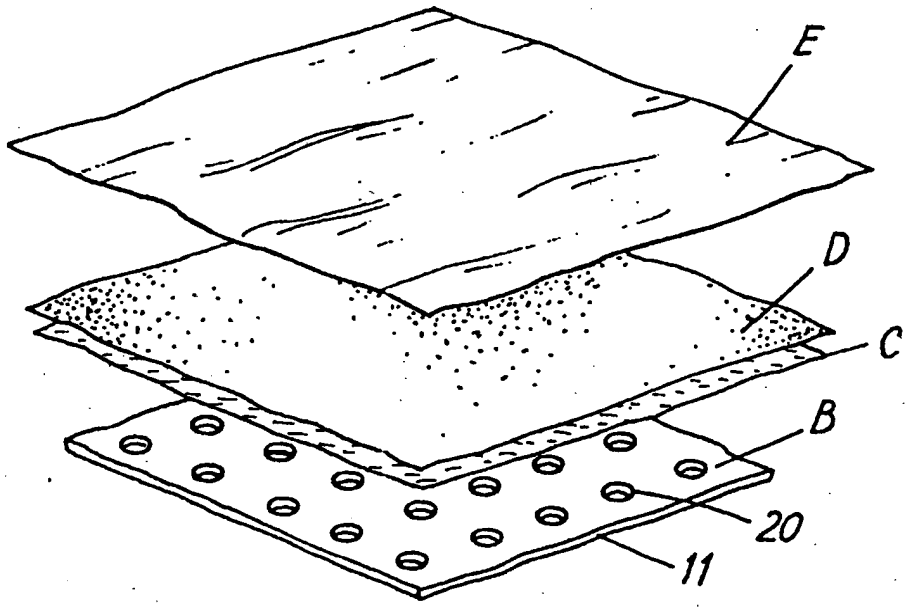
FIG. 6



SPECIFICATION

Wound dressing

This invention is directed to a multi-layered bandage useful in the treatment of open wounds such as decubitis ulcers. A problem with treating certain wounds, particularly ulcerated sores, is to meet the conflicting requirements of providing a comfortable covering which protects the wound and substantially doedorizes any escaping gas without impeding the passage of such gas away from the wound area.

The multi-layered bandage of this invention includes at least a layer of curative and absorbant material which contacts the wound, a layer of deodorizing material, and an outer flexible layer that secures the bandage to the body.

Figure 1 is an exploded view of a multi-layered bandage of this invention.

Figure 2 is a perspective view of the bandage of Figure 1 applied to a wound.

Figure 3 is an enlarged view of an alternate layer B.

Figure 4 is an enlarged view of another alternate layer B.

Figure 5 is an enlarged view of still another alternate layer B.

Figure 6 is an exploded view of another embodiment of the multi-layered bandage of this invention.

This invention is directed to a multi-layered bandage or dressing. The dressing includes a layer of curative and absorbant material which contacts the wound, a layer of deodorizing material, and an outer flexible layer that secures the bandage to the body.

The layer of curative and absorbant material is shown in the Figures as layer B. Layer B may be formed entirely as a homogeneous cohesive mass 11 as shown in Figures 1 and 2, layer B may be formed as a homogeneous cohesive mass 11 having a backing film 12 as shown in Figure 3, layer B may be formed as homogeneous mass 11 having as the backing an intermediate layer of semi-open cell polymeric foam 13 and an optional outer polymeric film 14 as shown in Figure 4, or layer B may be formed as a curative and absorbant foam 15 which may have an optional backing film 16 as shown in Figure 5.

The layer B has a plurality of apertures 20 extending through the curative and absorbant homogeneous mass or foam material and any of the optional backings that may be present. The apertures may be in a regular pattern or randomly placed. The ratio between the surface area of layer B and the apertures can vary from about 1:2 to 2:1, with about 1:1 being preferred. The apertures can be punched through layer B or may be formed by a molding operation. The particular shape and dimensions of layer B are not critical. The rectangular shape shown in the drawings is preferred though it may be desirable in treating wounds at various body locations such as the elbow or heel to have a circular shape. The layer B may vary in thickness from about 1 to about 4 mm. and the apertures may have a diameter of from about 2 to about 4 mm.

The homogeneous cohesive mass 11 comprises a blend of one or more water soluble or swellable hydrocolloids and a natural or synthetic viscous substance which acts as a binder for the hydrocolloids. The hydrocolloids are present at from about 30% to about 70% by weight of the mass. Suitable hydrocolloids include pectin, gelatin, karaya gum, guar gum, locust bean gum, and sodium carboxymethylcellulose provided that at least about 20% by weight of the mass is one or more curative hydrocolloid substances such as pectin, gelatin and karaya gum. Suitable viscous substances include natural rubber, silicone rubber, acrylonitrile rubber, polyurethane rubber, and polyisobutylenes and such binder is also present at from about 30% to about 70% by weight of the cohesive mass. Other substances such as a plasticizer, antioxidant, or a pharmaceutically active substance such as an antibacterial agent can be included within the mass at up to about 5% by weight and a cohesive strengthening agent, for example, fibrous cotton, finely divided wood cellulose or microcrystalline cellulose can be included within the mass at up to about 10% by weight. Preferably, the homogeneous cohesive mass 11 comprises about 20% by weight of pectin, about 20% by weight of gelatin, about 20% by weight of sodium carboxymethylcellulose, and about 40% by weight of polyisobutylene.

The backing film 12 as shown in Figure 3 is secured to the surface of the homogeneous cohesive mass 11 which does not contact the wound. The film 12 is a thin sheet of polymeric material such as polyethylene, polypropylene, polyvinylchloride, etc.

As shown in Figure 4, the cohesive mass 11 may have a layer of semi-open cell polymeric foam 13 secured to the surface which does not contact the wound. This form can be prepared from various elastomer materials such as polyester or polyether polyurethane foams, styrene-butadiene foams, or certain rubber-based foams. The preferred material is a flexible polyurethane foam having from about 50 to about 100 cells per linear inch. By semi-open cell it is meant that the percentage of open or ruptured cells is from about 30 to about 70%. An outer polymeric film 14 from a pliable elastomer material such as flexible polyurethane, polyacrylate, polyethylene, etc., may be secured to the foam.

The curative and absorbant homogeneous cohesive mass 11 may be prepared as taught by Chen in United States Patents 3,339,546 and 3,972,328 or Chen et al. in United States Patent 4,192,785. For example, the hydrocolloids and any optional ingredients, preferably in finely divided form, are blended and the mixture is slowly added to the viscous substance in a kneader mixer until a homogeneous mass is formed. The backing film 12 or the semi-open cell foam 13 and film 14 may then be secured and the apertures 20 punched therethrough. Alternatively, the homogeneous mixture of hydrocolloids and binder before setting may be molded to form the apertures 20.

The layer B of curative and absorbant material

may also be a foam 15 as shown in Figure 5. This foam can be prepared by h t air drying or lyophilizing a foamed aque us coll idal dispersion of or m re hydroc lloids such as pectin, gelatin, karaya gum, guar gum, locust bean gum, and sodium carboxymethylcellulose provided that at least about 20% by weight of the hydrocolloid dispersion is one or more curative hydrocolloid substances such as pectin, gelatin and karaya gum. Such foams are described in various patents such as United States Patents 2,465,357, 2,558,395 and 3,767,784. Preferably the foam is prepared from a mixture of gelatin, pectin and sodium carboxymethylcellulose. This preferred foam contains from about 10% to about 50% by weight of pectin and sodium carboxymethylcellulose and from about 20% to about 80% by weight of gelatin and is prepared by dry blending the hydrocolloids, adding the blend to water with agitation so as to form a colloidal dispersion having a solids content of from about 1% to about 20% by weight, foaming the colloidal dispersion so that its volume increases from about 10% to about 60%, freezing and then freeze drying.

An optional film backing 16 of various polymeric materials such as polyethylene, polypropylene, polyvinylchloride, etc., can be secured to the surface of foam 15 which does not contact the wound.

The layer of deodorizing material is shown as layer D in Figures 1, 2 and 6. This deodorizing layer is formed of an air-permeable woven or non-woven material carrying or impregnated with a deodorizing substance. One type of suitable material is a sheet of foamed non-woven synthetic polymeric material, for example, polyurethane, having a large number of activated carbon particles distributed over one of its major surfaces. Preferably, the carbon particles are bound to the top surface, i.e., that furthest away from layer B, and the surface which contacts layer B is coated with a layer adhesive. Such a material is commercially available under the tradename Bondina. Another type of suitable deodorizing material is a layer of carbon cloth such as that disclosed by Bailey et al. in British Patent 1,301,101.

As shown in Figure 6, an intervening layer C may be included within the dressing between deodorizing layer D and curative and absorbant layer B. This intervening layer C is an air-permeable but liquid-impermeable material such as a non-woven fabric and it serves to prevent any liquid discharge which passes through layer B from escaping further. However, any gaseous discharge from the wound passes through layer C to layer D where it is deodorized. Layer C can be coated with a microporous pressure sensitive adhesive on one or both sides.

The outer layer of the wound dressing is shown as layer E in Figures 1, 2 and 6. This layer is a flexible breathable adhesive tape which allows air and gas to pass therethrough. This layer comprises a porous n n-w ven fibrous or polymeric backing having a coating f a microporous pressure sensitive adhesive on its b ttom surface. Layer E extends in size bey nd the periphery f layers B, D and C so that it holds the dressing t gether. During shipping a piece of silicon releas pap r is attached across the bot- t m f layer B and the extending portion f layer E.

Examples of suitable materials for layer E are disclosed by Copeland in United States Patent 3,121,021 and Hodgson in United States Patent 3,645,835. It is also possible to replace the adhesive coating taught by Copeland with a hydroc ll id c ntaining pressure sensitive adhesive such as that taught by Chen in the above noted patents. The layer E allows any gas which has been deodorized by layer D to pass to the atmosphere. Layer E also secures the dressing to the patient and provides overall protection of the wound.

The dressing of this invention is employed by placing the proper sized piece over the wound so that layer B contacts the wound. Optionally, the wound can be packed under the dressing with the hydrocolloid containing adhesive mass disclosed by Chen in United States Patent 3,339,546, the hydrocolloid powder disclosed by Steinhardt in United States Patent 3,029,187, karaya gum, or other healing material. This packing is represented as A in Figure 2. The dressing is changed on a periodic bases and the wound is kept covered until the healing is complete.

CLAIMS

1. A wound dressing comprising a layer of curative and absorbant material which contacts the wound and has a series of apertures therethrough, a layer of air-permeable deodorizing material, and an outer flexible air-permeable layer having an adhesive coating which secures the dressing to the body.

2. The dressing of Claim 1 wherein said layer of curative and absorbant material is a homogeneous mass of from about 30% to about 70% by weight of one or more hydrocolloids selected from the group consisting of pectin, gelatin, karaya gum, guar gum, locust bean gum, and sodium carboxymethylcellulose provided that at least about 20% by weight of said mass is one or more curative hydrocolloids selected from the group consisting of gelatin, pectin and karaya gum and from about 30% to about 70% by weight of a viscous binder selected from the group consisting of natural rubber, silicone rubber, acrylonitrile rubber, polyurethane rubber and polyisobutylenes.

3. The dressing of Claim 2 wherein said homogeneous mass has a thin flexible polymeric film attached to the surface which does not contact the wound and said apertures extend through said homogeneous mass and said film.

4. The dressing of Claim 2 wherein said homogeneous mass has a layer of semi-open cell polymeric foam secured to the surface which does not contact the wound and said apertures extend through said homogeneous mass and said polymeric foam.

5. The dressing of Claim 4 wherein said semi-open cell foam has a thin polymeric film secured to its top surface and said apertures extend through said homogeneous mass, said polymeric foam, and said film.

6. Th dressing f Claim 2 wherein said homogene us mass is ab ut 20% by weight of gelatin, about 20% by weight of pectin, about 20% by weight f sodium carb xymethylcellulose, and about 40% by weight of polyisobutylene.

7. The dressing f Claim 1 wherein said layer of

curative and absorbant material is a foam of n or mor hydrocolloids selected from the group consisting of pectin, gelatin, karaya gum, locust bean gum, guar gum and sodium carboxymethylcellulose provided that the foam contains at least about 20% by weight of one or more curative hydrocolloids selected from the group consisting of gelatin, pectin and karaya gum.

8. The dressing of Claim 7 wherein said foam contains from about 10% to about 50% by weight of pectin, from about 10% to about 50% by weight of sodium carboxymethylcellulose, and from about 20% to about 80% by weight of gelatin.

9. The dressing of Claim 7 wherein a thin polymeric film is secured to said foam and said apertures extend through said foam and film.

10. The dressing of Claim 1 wherein a layer of air-permeable liquid-impermeable non-woven fabric is included within the dressing between said curative and absorbant layer and said layer of deodorizing material.

11. The dressing of Claim 1 wherein said layer of deodorizing material is a foamed non-woven synthetic material having a large number of activated carbon particles distributed over one of its major surfaces.

12. The dressing of Claim 1 wherein said layer of deodorizing material is carbon cloth.

13. The dressing of Claim 1 wherein said outer layer is a porous non-woven fibrous backing having a coating of microporous pressure sensitive adhesive.

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